

(PCT Article 36 and Rule 70)

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|---|-----------------------------------|
| Date of submission of the demand | Date of completion of this report |
| Name and mailing address of the IPEA/JP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/016981

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1, 2, 4-15 as originally filed/furnished
- pages* 3 received by this Authority on 22.04.2005
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. 3, 4, 9-18, 20-24 as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1, 2, 5-8, 19 received by this Authority on 22.04.2005
- nos.* _____ received by this Authority on _____
- ☒ the drawings:
- sheets 1-13 as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☒ the claims, nos. 25
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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| Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | |
|---|---|-------------|-----|
| 1. Statement | | | |
| Novelty (N) | Claims | <u>1-24</u> | YES |
| | Claims | <u></u> | NO |
| Inventive step (IS) | Claims | <u>1-24</u> | YES |
| | Claims | <u></u> | NO |
| Industrial applicability (IA) | Claims | <u>1-24</u> | YES |
| | Claims | <u></u> | NO |
| 2. Citations and explanations (Rule 70.7) | | | |
| Document 1: WO 1996/039357 A1 (Michigan State University), 12 December 1996 | | | |
| Document 2: JP 2002-042808 A (Canon Inc.), 08 February 2002 | | | |
| Document 3: JP 2004-214116 A (National Institute of Advanced Industrial Science and Technology), 29 July 2004 | | | |
| Document 4: JP 2003-077541 A (Mitsubishi Heavy Industries, Ltd.), 14 March 2003 | | | |
| Document 5: JP 2003-077466 A (Mitsubishi Heavy Industries, Ltd.), 14 March 2003 | | | |
| Claims 1 to 10 | | | |
| Claims 1 to 10 are novel and involve an inventive step. | | | |
| The inventions set forth in claims 1 to 10 are not disclosed in any of the documents that are cited in the international search report; therefore, the inventions in question are novel and involve an inventive step. In particular, the abovementioned documents do not disclose the feature wherein P ₂ O ₅ is included in the glass phase of a mesoporous composite material that comprises oxide nanocrystals and glass. On the other hand, the inventions | | | |

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

set forth in the present application exhibit an advantageous effect in that it is possible to obtain an oxide nanocrystal/glass-based mesoporous composite material with a framework that includes uniformly-sized nanocrystals with particle sizes on the order of 3 to 5 nm as a result of the feature in question.

Claims 11 to 24

Claims 11 to 24 are novel and involve an inventive step.

The inventions set forth in claims 11 to 24 are not disclosed in any of the documents that are cited in the international search report; therefore, the inventions in question are novel and involve an inventive step. In particular, the abovementioned documents do not disclose the feature wherein the mesoporous composite material that comprises oxide nanocrystals and glass is used in the electrodes of a secondary battery. On the other hand, the inventions set forth in the present application exhibit an advantageous effect in that the resulting secondary battery has both an ion conducting path and an electron conducting path as a result of the feature in question.

Meanwhile, document 1 discloses a feature wherein a partially crystalline mesoporous material, which has mesopores that are arranged in a regular pattern, is used in an adsorption/separation process or in a catalyst (in particular, refer to page 1, line 24 to page 2, line 6).

Document 2 discloses a lithium ion secondary battery wherein a mesoporous material that comprises a tin oxide is used in the negative electrode material (in

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particular, refer to the claims).

Document 3 discloses a secondary battery wherein a mesoporous material that comprises a noble metal and/or a transition metal is used in the electrodes (in particular, refer to the claims).

Document 4 discloses a lithium ion secondary battery wherein a mesoporous material that comprises an amorphous oxide is used in the positive electrode material (in particular, refer to the claims).

Document 5 discloses a lithium ion secondary battery and a lithium ion capacitor wherein a mesoporous material that comprises an amorphous manganese compound is used in the electrodes (in particular, refer to the claims).